



The Geophysics Group

Earth & Environmental Sciences

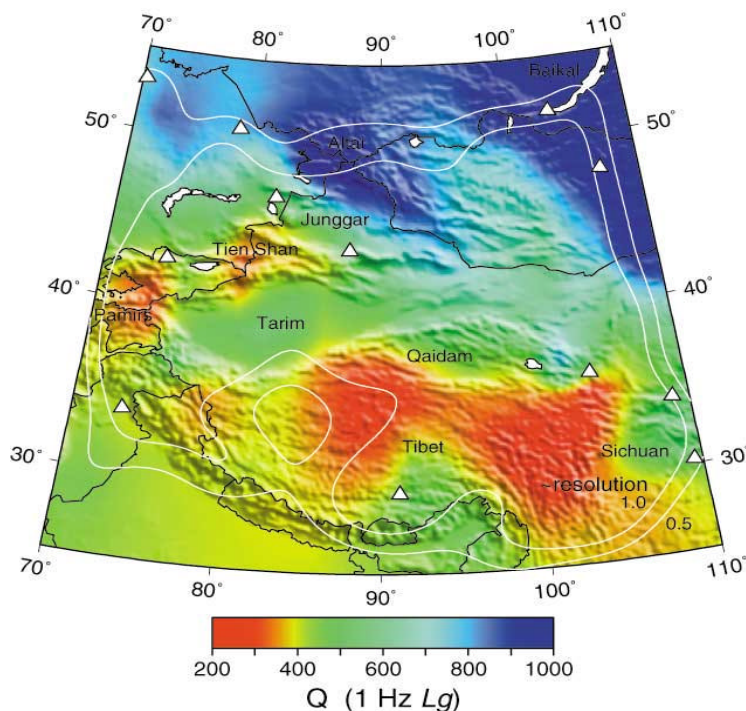
Regional Coda Magnitude in Central Asia

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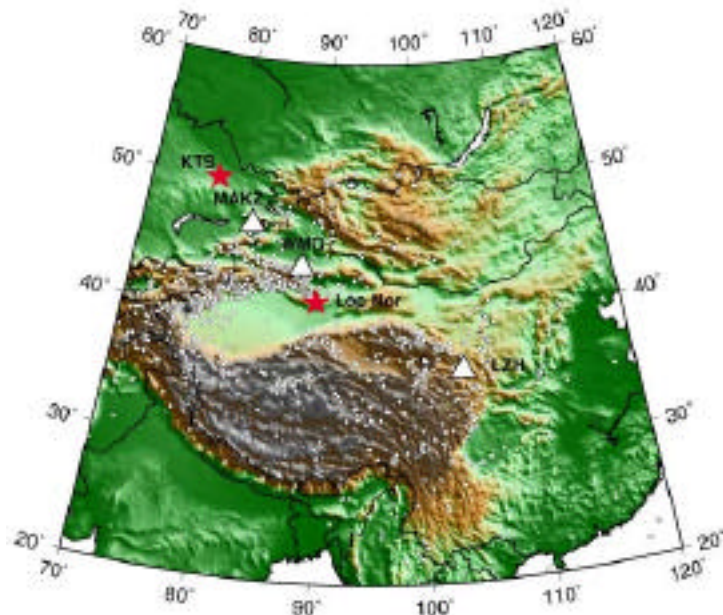
Introduction

Coda yield more accurate and precise estimates of source effects than can be obtained from direct waves. The improved accuracy results from path averaging of the scattered waves. The improved precision results from stacking independent measurements. In the following pages, we investigate the use of regional distance Lg coda to estimate magnitudes in central Asia. This is an geologically heterogeneous region, which, as we will show, introduces path bias into the coda measurements, yet coda still give magnitude estimates that are nearly a factor of two more consistent between stations than do Lg.

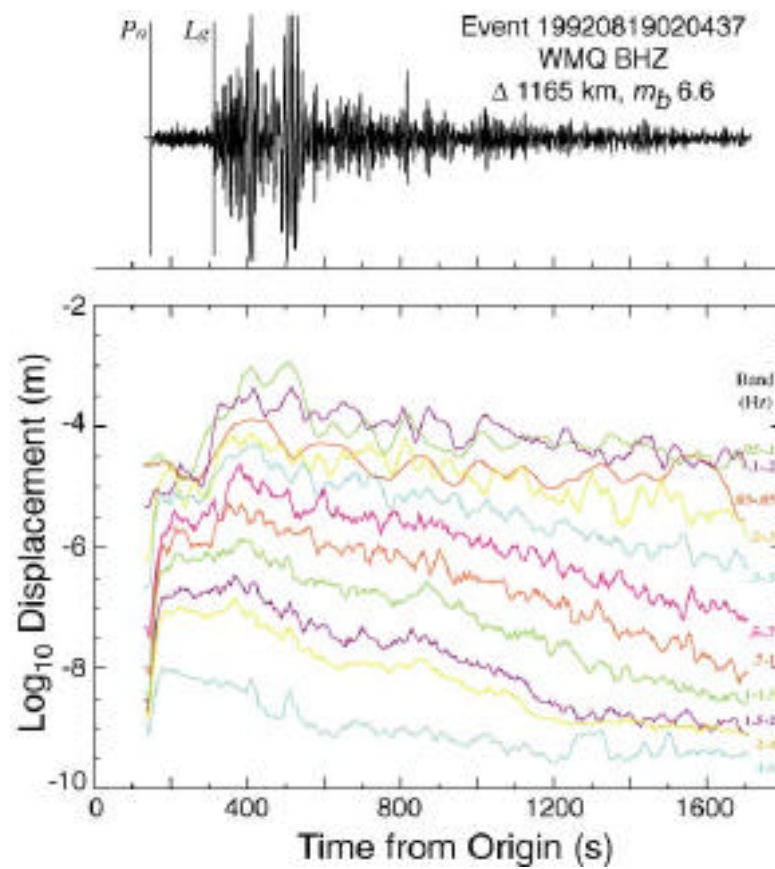


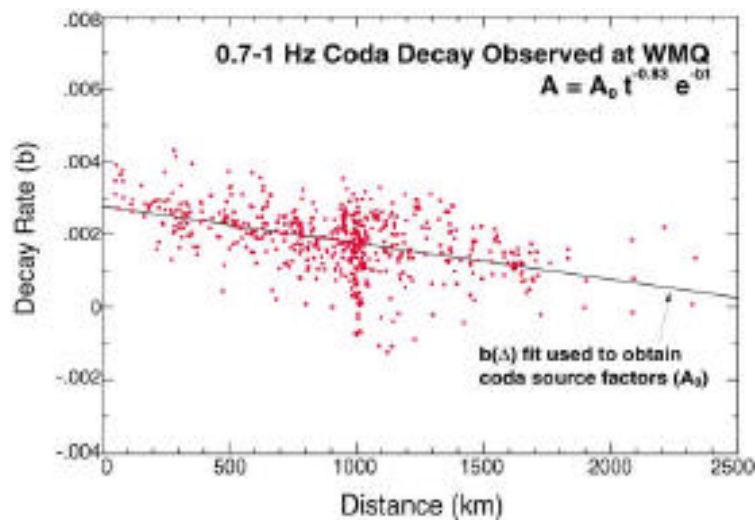
Q tomography results reflect the geologic heterogeneity of this region.

Data Processing

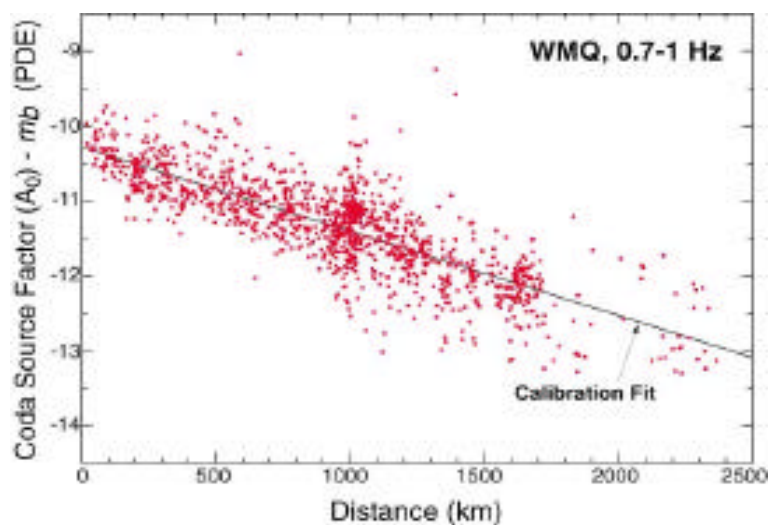


Our data consist of over 3000 broadband records from stations WMQ, MAK(Z) and LZH.

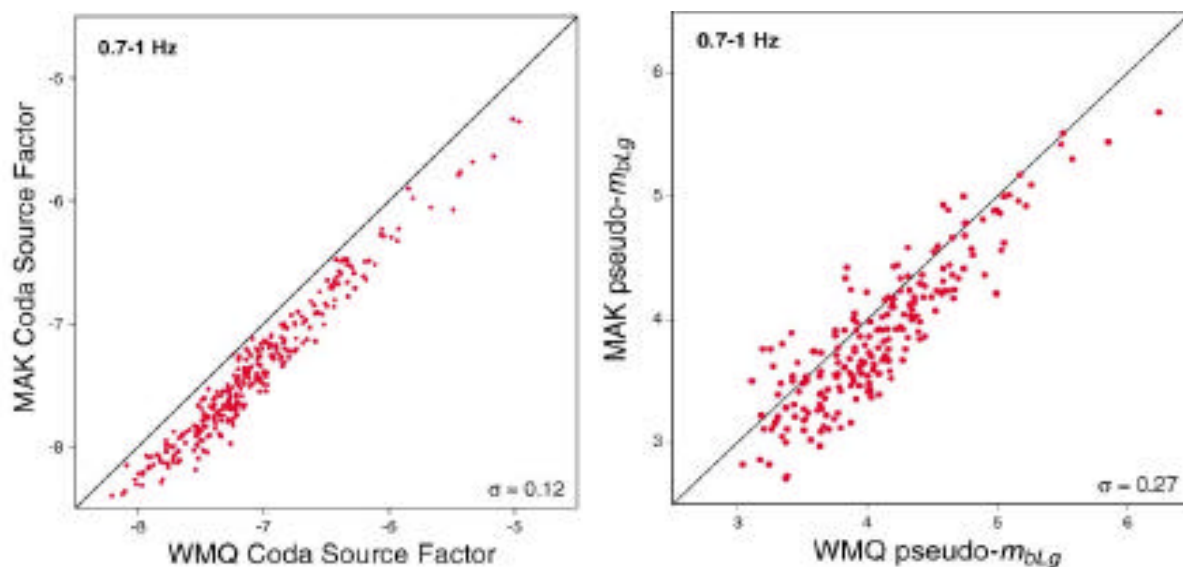




A linear fit to distance is used to predict coda decay rate and obtain coda source factors.

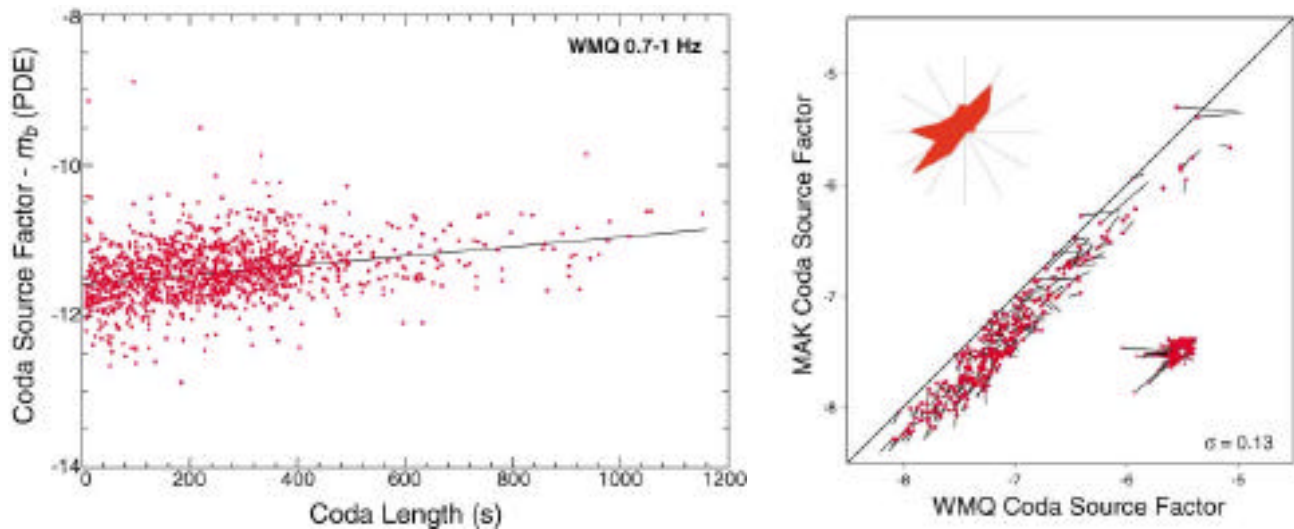


Another linear fit to distance is used to correct coda source factors.



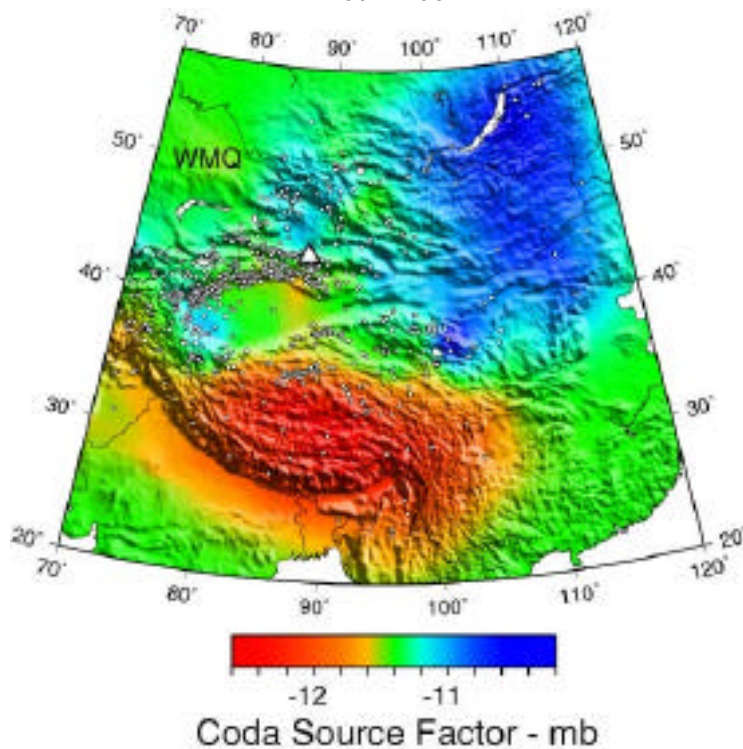
We obtain higher inter-station consistency from coda than from Lg (0.7-1 Hz).
However, biases affect these results as we show next.

Coda Length Bias



We observe a coda length trend consistent with the well-known "lapse-time" effect.
Correction for this trend does not improve inter-station consistency because corrections are correlated.
We choose to limit coda lengths to avoid this bias.

Path Bias



Interpolated path correction (kriging) improves inter-station consistency for Lg but not coda.

Coda measurements are nearly a factor of two more consistent than Lg after path correction

LZH-WMQ measurements are less consistent and coda yield only modest improvement.

